WHAT IS CLAIMED IS:

1. A method for providing public and private mobile communication service in a mobile communication system including public cell areas each having a corresponding base station transceiver subsystem for communicating with mobile stations having access to a public mobile communication service, a plurality of base station controllers for communicating with the base station transceiver subsystems, a mobile switching center for communicating with said base station controllers and with a public switched telephone network and an integrated services digital network, said mobile switching center being connected to a location register unit including a home location register and a visitor location register, said method comprising the steps of:

forming a common cell area in which a mobile station can communicate with a private mobile communication service and said public mobile communication service, said step of forming a common cell area comprising the steps of:

constructing a mobile communication network including a private base station transceiver subsystem for communicating with said mobile station within said common cell area, and including a public and private communication service unit for communicating with an Internet protocol network, one of said base station controllers, said public switched telephone network and said integrated services digital network; and

registering said mobile station in said common cell area in a private visitor location register included in said public and private communication service unit for enabling said mobile station in said common cell area to communicate with said private mobile communication service.

2. The method as set forth in claim 1, wherein said step of registering comprises the steps of:

utilizing an operator console in a call manager included in said public and private communication service unit to request registration for said private mobile communication service;

displaying a service registration input screen on a monitor of said operator console;

inputting information indicative of said mobile station and a subscriber to said private communication service; and

storing said information in a database of said private visitor location register.

3. The method as set forth in claim 1, further comprising the steps of:

determining whether a message from said mobile station in said common cell area is service request corresponding to an event stored in a router table of said public and private communication service unit, wherein said router table is disposed within a private message router and stores event information corresponding to one or more of a call origination service, a call termination service, a call transfer service, a call forwarding service, a wireless in-building data service, a wireless in-building short message service and a location registration service;

performing a location registration service operation to enable said mobile station to receive the private mobile communication service in said common cell area, when it is determined that the message from said mobile station corresponds to said location registration service; and

transmitting a message to said mobile station in said common cell area to inform said mobile station that it is registered for the private mobile communication service in the common cell area.

4. The method as set forth in claim 2, further comprising the steps of:

analyzing every message being applied to the public and private communication service unit;

transparently transmitting the messages for the public mobile communication service to the base station controller in communication with said public and private communication service unit; and

routing the messages for the private mobile communication service to said call manager.

5. The method as set forth in claim 4, further comprising the steps of:

determining whether the message to said call manager from said mobile station in said common cell area is service request corresponding to an event stored in a router table in said call manager, wherein said router table is disposed in a private message router and stores event information corresponding to one or more of a call origination service, a call termination service, a call transfer service, a call forwarding service, a wireless in-building data service, a wireless in-building short message service and a location registration service;

performing a location registration service operation to enable said mobile station to receive the private mobile communication service in said common cell area, when it is determined that the message from said mobile station corresponds to said location registration service; and

transmitting a message to said mobile station in said common cell area to inform said mobile station that it is registered for the private mobile communication service in the common cell area.

6. The method as set forth in claim 3, wherein said step of performing a location registration service operation comprises the steps of:

transmitting the message corresponding to said location registration service via a communication path from said private message router to said home location register and said visitor location register, said communication path including said base station controller in communication with said public and private communication service unit and said mobile switching center;

transmitting an acknowledgment message back to said message router via said communication path when it is determined that said mobile station is registered in one of said home and visitor location registers for said public mobile communication service, said message router requesting said private visitor location register to analyze whether said mobile station in said common cell area is registered for said private mobile communication service;

determining whether the analysis performed by said private visitor location register indicates said mobile station in said common cell area is registered for said private mobile communication service;

transmitting a location registration request message from said message router to a private mobile switching center through a private base station controller of said public and private communication service unit, wherein said private mobile switching center of said public and private communication service unit registers the location of said mobile station in said private visitor location register.

7. The method as set forth in claim 5, wherein said step of performing a location registration service operation comprises the steps of:

transmitting the message corresponding to said location registration service via a communication path from said private message router to said home location register and said visitor location register, said communication path including said base station controller in communication with said public and private communication service unit and said mobile switching center;

transmitting an acknowledgment message back to said message router via said communication path when it is determined that said mobile station is registered in one of said home and visitor location registers for said public mobile communication service, said message router requesting said private visitor location register to analyze whether said mobile station in said

common cell area is registered for said private mobile communication service;

determining whether the analysis performed by said private visitor location register indicates said mobile station in said common cell area is registered for said private mobile communication service;

transmitting a location registration request message from said message router to a private mobile switching center through a private base station controller of said public and private communication service unit, wherein said private mobile switching center of said public and private communication service unit registers the location of said mobile station in said private visitor location register.

8. The method as set forth in claim 1, further comprising a step of performing a wire and wireless complex function by said public and private communication service unit, said wire and wireless complex function comprising the steps of:

informing a private mobile switching center of said public and private communication service unit that a call terminates at a wire extension terminal of a private branch exchange;

requesting, by said private mobile switching center, a private visitor location register to analyze whether there exists a mobile identification number of a private mobile communication service-registered mobile station corresponding to the wire extension terminal;

determining, based on an analysis result obtained by said private visitor location register, whether the mobile identification number corresponding to the wire extension terminal exists for the private mobile communication service-registered mobile station; and

transmitting a ring message to said private mobile communication service-registered mobile station, when it is determined that the mobile identification number corresponding to the wire extension terminal exists.

9. The method as set forth in claim 9, further comprising a step of ringing said wire extension terminal and said private mobile communication service-registered mobile station simultaneously.

10. An apparatus for providing public and private mobile communication service in a mobile communication system including public cell areas each having a corresponding public base station transceiver subsystem for communicating with mobile stations having access to a public mobile communication service, a plurality of public base station controllers for communicating with the public base station transceiver subsystems, a public mobile switching center for communicating with said public base station controllers and with a public switched telephone network and an integrated services digital network, said public mobile switching center being connected to a location register unit including a public home location register and a public visitor location register, said apparatus comprising:

public and private communication service unit for communicating with an Internet protocol network, one of said public base station controllers, said public switched telephone network and said integrated services digital network; and

a private base station transceiver subsystem for communicating with a mobile station within a common cell area in which said mobile station can communicate with a private mobile communication service and said public mobile communication service, wherein said mobile station in said common cell area is registered in a private visitor location register included in said public and private communication service unit for enabling said mobile station in said common cell area to communicate with said private mobile communication service, and is further registered in at least one of said public home location register and said public visitor location register for enabling said mobile station in said common cell area to communicate with said public mobile communication

service.

11. The apparatus as set forth in claim 10, said public and private communication service unit comprising:

a call manager which is a main controller of the public and private communication service unit;

a private branch exchange connected to said public switched telephone network and said integrated services digital network; and

a first private base station controller for communicating with said mobile station within said common cell area, said public base station controller, said call manager and said private branch exchange.

12. The apparatus as set forth in claim 11, said first private base station controller comprising:

a private communication interconnection network for analyzing a message type and origination addresses and termination addresses included in a received message, and then transmits the analyzed information via a communication path to one of said private base station transceiver subsystem, said public base station controller, said call manager and said private branch exchange; and

a transcoder and selector bank for traffic data interfacing between said private branch exchange and said first private base station controller.

13. The apparatus as set forth in claim 12, wherein said transcoder and selector bank performs a 2.048Mbps and 1.544Mbps non-multiple transmission channel interfacing function, a vocoder function for voice coding and decoding, a soft handoff control and voice selecting function,

and a power control function.

14. The apparatus as set forth in claim 12, said first private base station controller comprising an Internet protocol network interface board assembly module connected to the private communication interconnection network for controlling a wireless in-building data service and has a function of transmitting, to a local area network, packet data received from the mobile station in said common cell area, which uses a point-to-point protocol server and a TCP/IP (Transmission Control Protocol/Internet Protocol).

15. The apparatus as set forth in claim 11, said call manager includes software blocks consisting of:

a data communication interface for interfacing communication between the private communication interconnection network and the call manager;

a message router for managing path designation for every message to be processed in the private base station transceiver subsystem;

a second private base station controller performs as a main controller of the first private base station controller and controls the private base station transceiver subsystem;

a private mobile switching center for performing interfacing for interworking with the private branch exchange and for determining whether to process a requested service as the public mobile communication service or the private mobile communication service;

a private branch exchange mobile interface controller for controlling a wire and wireless complex function;

a short message service controller for managing a short message service control function and a short message service web server function;

a private visitor location register for managing the private mobile communication service-registered subscriber information, the private mobile communication subscribers location registration information, and various functional service information;

a wire service manager for managing the whole mobile communication service function provided from the public and private communication service unit; and

a local area network interface module for managing communication with the local area network.

16. The apparatus as set forth in claim 15, wherein said message router designates a signaling message path for public and private call origination and termination services of the mobile station by consulting a router table therein, and designates a message path for a maintenance service of the private base station transceiver subsystem.

17. The apparatus as set forth in claim 16, wherein said message router determines whether a message to said call manager from said mobile station in said common cell area is a service request corresponding to an event stored in a router table disposed in said message router, and stores event information corresponding to one or more of a call origination service, a call termination service, a call transfer service, a call forwarding service, a wireless in-building data service, a wireless in-building short message service and a location registration service;

said message router performing a location registration service operation to enable said mobile station to receive the private mobile communication service in said common cell area, when it is determined that the message from said mobile station corresponds to said location registration service; and

wherein said message router transmitting a message to said mobile station in said common

cell area to inform said mobile station that it is registered for the private mobile communication service in the common cell area.

18. The apparatus as set forth in claim 17, wherein said location registration service operation comprises:

transmitting the message corresponding to said location registration service via a communication path from said message router to said public home location register and said public visitor location register, said communication path including said public base station controller in communication with said public and private communication service unit and said public mobile switching center;

transmitting an acknowledgment message back to said message router via said communication path when it is determined that said mobile station is registered in one of said public home and visitor location registers for said public mobile communication service, said message router requesting said private visitor location register to analyze whether said mobile station in said common cell area is registered for said private mobile communication service;

determining whether the analysis performed by said private visitor location register indicates said mobile station in said common cell area is registered for said private mobile communication service;

transmitting a location registration request message from said message router to said private mobile switching center through said second private base station controller, wherein said second private mobile switching center registers the location of said mobile station in said private visitor location register.

19. The apparatus as set forth in claim 15, wherein said wire and wireless complex

function comprises:

informing a private mobile switching center of said public and private communication service unit that a call terminates at a wire extension terminal of a private branch exchange;

requesting, by said private mobile switching center, a private visitor location register to analyze whether there exists a mobile identification number of a private mobile communication service-registered mobile station corresponding to the wire extension terminal;

determining, based on an analysis result obtained by said private visitor location register, whether the mobile identification number corresponding to the wire extension terminal exists for the private mobile communication service-registered mobile station;

ringing said wire extension terminal; and

transmitting a ring message to said private mobile communication service-registered mobile station, when it is determined that the mobile identification number corresponding to the wire extension terminal exists.